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ABSTRACT

Illinois-funded Project IMPACT was designed to identify and develop procedures for complying with the impact requirement of Public Law 94-482, with regard to the effect of vocational education research and development on vocational education programs. The study addressed itself to three problem areas: (1) how to define impact, (2) how to assess impact, and (3) how to show a cause-and-effect relationship between project activities and changes in vocational education teaching-learning situations. The project also investigated how to predict the probability of impact, and how to manage ongoing contracts to increase impact probability. In this first volume of the phase 1 reports, Project IMPACT is defined, principles of assessing impact are determined, and methods of study are decided through a review of literature and an analysis of case study methods. The review of literature on planned change and impact assessment showed that evidence of impact may be direct or indirect; that the time between cause and effect of impact is longer for intellectual products than for tangible products, and that it is desirable to assess impact of a project at the school district level rather than at higher administrative levels. It also showed that numerous characteristics which are associated with high versus low impact have been identified and that the degree to which these characteristics are present or absent may be useful in predicting actual impact. Through the analysis of case study methods, procedures for assessing impact of vocational education projects through case studies were established. These procedures were followed in the case studies in volumes 2-8 of this series (see note). (KC)

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DEVELOPMENT OF PROCEDURES FOR ASSESSING THE IMPACT OF VOCATIONAL EDUCATION RESEARCH AND DEVELOPMENT ON VOCATIONAL EDUCATION (PROJECT IMPACT)

Volume 1 - Context and Principles of Assessing Impact

STATE BOARD OF EDUCATION
Donald F. Muirheid, Chairman

ILLINOIS OFFICE OF EDUCATION
Joseph M. Cronin, State Superintendent of Education

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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Development of Procedures for Assessing the Impact of Vocational Education Research and Development on Vocational Education (PROJECT IMPACT)

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DEVELOPMENT OF PROCEDURES FOR ASSESSING THE IMPACT OF VOCATIONAL EDUCATION RESEARCH AND DEVELOPMENT ON VOCATIONAL EDUCATION

STATE BOARD OF EDUCATION
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Abstract

Volume I is part of the final report for Phase 1 of the Illinois state-funded project "Development of Procedures for Assessing the Impact of Vocational Education Research and Development on Vocational Education" - (PROJECT IMPACT).

This document contains an introduction to PROJECT IMPACT, a review of literature and views of experts in regard to planned educational change and impact, the methods used to conduct impact case studies, a concise listing of references used during Phase 1 activities, and appended materials such as the initial project proposal and data collection instruments which were developed for us in the case studies. Supplemental reports of the project are contained in the following volumes:

Volume 2 -- A Case Study of the "Illinois Occupational Curriculum Project"

Volume 3 -- A Case Study of the "Illinois Network of Exemplary Occupational Programs for Handicapped and Disadvantaged Students"

Volume 4 -- A Case Study of "Illinois Projects in Horticulture"

Volume 5 -- A Case Study of "Illinois Career Education Projects at the Awareness Level"

Volume 6 -- A Case Study of the "Occupational Survival Skills Project"

Volume 7 -- Case Studies of "Two Illinois School Districts With Innovative Vocational Education Programs"

Volume 8 -- A Field Study of "Predicting Impact of Research and Development Projects in Vocational and Technical Education"

Volume 9 -- Executive Summary of Volumes 1-8 and Conclusions and Recommendations for Assessing the Impact of Vocational Education Research and Development on Vocational Education

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Chapter 1

Introduction to PROJECT IMPACT

Federal legislation of 1867 established the United States Department of Education (later USOE and now Department of Education) and required that it collect "such statistics and facts as shall show the condition and progress of education in the several states and territories, and of diffusing information respecting the organization and management of schools and school systems and methods of teaching" (Suppes, 1978). In order to carry out these responsibilities, USOE has funded numerous research and development (R & D) activities in some areas of education for over 100 years. Vocational education, however, was not a USOE responsibility until the passage of the Smith-Hughes Act in 1917. Very little research was done in this area from 1917 to 1963.

Prior to 1963, research in vocational education was done primarily by professional associations and doctoral students. Large-scale R & D activities were first made possible by the Vocational Education Act of 1963 (Public Law 88-120) when Congress appropriated 10% of the vocational education money for each fiscal year to go toward R & D activities. By 1965, Illinois and 23 other states had established Research Coordinating Units (RCUs). In 1968, Congress revised the Vocational Education Act of 1963 with the "1968 Amendments" (Public Law 90-576) and made the RCUs a permanent part of vocational education. By 1969, each state and territory of the United States had an RCU.

In 1974, USOE asked the National Academy of Sciences (NAS) to assess the impact of approximately 250 million dollars spent by USOE on vocational education R & D activities during the 10 years between 1965 and 1974. The NAS Committee on Vocational Education Research and

Development (COVERD, 1976) reported that the R & D of the decade studied did not have documented, widespread impact on the knowledge, skills or employability of large numbers of students except in curriculum development. National evaluations of vocational R & D in addition to the COVERD report have been similarly critical (Development Associates, 1975; Rand Corporation, 1975; Comptroller General of the United States, 1974). Acting upon these reports, Congress passed the Educational Amendments of 1976 (Public Law 94-482) which mandated that contracts for R & D in vocational education would not be made unless the applicant could "demonstrate a reasonable probability" that the contract would result in improved teaching techniques or curriculum materials that would be used in a "substantial number of classrooms or other learning situations within five years after termination of such contracts" (Federal Register, 1977).

At the same time that evaluators said they could not find very much evidence of impact (especially on students), they also said that they lacked impact measures and impact data. Moore and Magisos (1977) reviewed the COVERD report and other national evaluations of vocational education R & D. They concluded that the criteria for subsequent evaluations "should be explicit enough to provide direction for instrument design and data collection." They also concluded that "total evaluation ought to be programmatic, linking several projects together, so that the summative evaluation is broadly based."

The purpose of PROJECT IMPACT was to identify and develop procedures for complying with the impact requirement of Public Law 94-482. The study addressed itself to three problem areas: (1) how to define impact, (2) how to assess impact, and (3) how to show a cause-and-effect relationship between project activities and changes in the

vocational education teaching-learning situations. The project also addressed two subsidiary problems: (1) how to predict the probability of impact and (2) how to manage on-going contracts to increase impact probability.

The methods used to conduct this study were to review literature related to the problem areas, to interview individuals who have experience and expertise in the problem areas, and to analyze the process of impact of several programs of related projects which were funded by the Illinois Office of Education's Division of Adult, Vocational and Technical Education (IOE/DAVTE) since it established an RCU and one project funded by the Comprehensive Employment and Training Act (CETA).

The major activity of this study was analyzing the programs (cases) of related R & D projects. For the first year, it was decided to select two cases for "top-down" analysis and two cases for "bottom-up" analysis (see Appendix A, p. 43). The project staff referred to these types of retrospective analysis as "tracking." It was anticipated that the two types of tracking would produce different insights about impact. For example, bottom-up tracking might better identify "bottlenecks" to impact than would top-down tracking while "top-down" tracking might be more effective in relating project intents and project outcomes. One staff member was assigned as "tracking manager" for each of the four cases and was instructed to keep a detailed log of her/his activities (e.g., identifying documents, retrieving documents, identifying key people and interviewing them, recording data, analyzing data).

Nominations for the first four case studies were sought from members of PROJECT IMPACT's Advisory Committee, project consultants,

and project staff members. The following cases were selected for "top-down" tracking:

1. "A Research and Development Project in Occupational Education" (The Illinois Occupational Curriculum Project -- I.O.C.P.) which was developed by Joliet Junior College and funded by them and by IOE/DAVTE in fiscal years 1970-72.
2. "The Illinois Network of Exemplary Occupational Programs for Handicapped and Disadvantaged Students." At the time the case study was initiated, the network was in its fourth year of operation. It was in the "dissemination" stage and IOE/DAVTE had funded Illinois State University to coordinate dissemination for the Network's eight demonstration projects.

The third and fourth cases, which were selected for "bottom-up" tracking, were:

3. "Illinois Projects in Horticulture." IOE/DAVTE funded some twelve R & D projects in horticulture between 1967 and 1978. Both private and public schools participated in these R & D efforts.
4. "Illinois Career Education Projects at the Awareness Level." IOE/DAVTE funded three or more major projects in this area between 1970 and 1978, and CETA began funding one for the Illinois Department of Correction in 1975.

The remainder of Volume 1 is divided into Chapters 2 and 3. Chapter 2 reviews literature pertinent to impact study as well as ideas which surfaced during planning and review sessions at PROJECT IMPACT. Chapter 3 contains a review of literature on case study methodology and the details of the tracking methods used in the first four case studies.

Chapter 2

Review of Literature and Views of Experts on Planned Change and Impact Assessment

Literature on planned change and assessment of programmatic impact, as well as views of experts which surfaced during the "brainstorming" sessions of Phase 1 of PROJECT IMPACT, are included in the following review. The review is contained in two sections -- one on "planned change" and one on "impact assessment."

Planned Change

Watzlawick, Weakland, and Fisch (1974) described two types of change -- "first-order change" (where things have only been moved around) and "second-order change" (where a real difference has been made). Methods of effecting second-order change have been investigated as an area of study for about 20 years. Some of the most cited investigations of planned change were done by Lippitt, Watson, and Westley (1958); Bennis, Benne, and Chin (1961); Rogers (1962); Havelock, Huber, and Zimmerman (1969); and Rogers and Shoemaker (1971). A national conference on planned change was held at the University of Michigan in 1973. In the published work of this conference (Havelock & Havelock, 1973), four major perspectives on the change process were presented as alternative models for effecting change: a Problem-Solving model, a Social-Interaction model, a Research and Development model, and a Linkage model. Berman and McLaughlin (1974) pointed out that each of these models focuses on <u>preadoption</u> behavior (awareness, interest, evaluation, trial, adoption) and ignores the issue of implementation or institutional adaptation of an

innovative strategy. Berman and McLaughlin said that while these models may be adequate for technologies or technological products they are inadequate for educational innovations. They explained that a technology or a technological product is usually invariate in its implementation and in its outcome from one context to another, but an educational innovation has characteristics which usually make its installation variate. Characteristics of technologies or technological products versus characteristics of educational innovations were listed by Berman and McLaughlin as follows (pp. 9-10):

Technologies or Technological Products	Educational Innovations
- Specificity of treatment	- Treatments are incompletely specified
- A clear relation between treatment and outcome; certainty of outcome	- Outcomes are uncertain
- Passive user involvement	- Active user involvement is required
- A unitary adopter	- The adopter is not unitary but a policy system or policy units
- Clarity and specificity of goals	- The relationship of project treatment to overall institutional goals is unclear or unspecified

Miles (1964) described the installation of a technology or a technological product as a mechanical process, and the installation of an educational innovation as an evolutionary process. Berman and McLaughlin called the evolutionary process a "mutation phenomenon" and explained that "innovation A^1 may become innovation A^2 when it is implemented in another setting, and it may be again changed to become A^3 as it is carried out at yet another site." They pointed out that the process which really occurs when an educational innovation is implemented is an organizational process. This is a two-way process of adaptation in which the innovation is modified to suit the institution,

and the institution changes to some degree to accommodate the innovation. Because of the mutation phenomenon, there is very limited utility in pooling data on different schools or in looking only at relationships between treatment and student outcomes when one is trying to assess change.

Pincus (1974) concluded that postadoption behavior of the school is one of the variables affecting student outcomes. Pincus suggested that project planners should consider the institutional change which any adoption would require. Pincus categorized types of change as follows:

- Change that increases the level of resource use only
- Change that affects the resource mix
- Change that affects instructional processes or methods without altering resource level mix
- Change that affects administrative management without significant alteration of the organizational power structure
- Change that affects either the organizational structure of the school or the school's relation to external authority

Seidman (1978) hypothesized that rates of returns on investments in educational innovations are related to the types of changes required for adoption (or adaptation). For example, he said, "Changes in role relationships take more time than changes in technological processes or products."

A new model for planned educational change was introduced by Berman and McLaughlin (1974). They proposed a three-stage process model which focuses on postadoption rather than on preadoption behavior. First is a Support stage, second is an Implementation stage, and third is an Incorporation stage. The Support stage involves a series of decisions on the part of potential users of an innovation. These decisions go far beyond a rational consideration of the merits of an innova-

tion, and the decisions are essentially political. That is, costs and benefits are institutional or personal rather than budgetary. The critical decisions of the Implementation stage are made by school districts. The extent to which an innovation is adopted (or adapted) depends on local interests, incentives, and priorities. The Incorporation stage is the point at which an innovation loses its project status and becomes part of the school district. As "seed money" is withdrawn, cost/benefit questions become central to making decisions about incorporating an innovation in part or in whole. Although continuation of an innovation at district expense is a measure of high project impact, it cannot be said that discontinuation is an index of low project impact. The variables affecting Incorporation are many and complex.

A considerable amount of the literature on planned educational change focuses on adoption, implementation or incorporation of what Swanson (1976) called physical products as opposed to intellectual products of educational R & D activities. Physical projects such as standardized tests and equipment, texts, films or other teaching materials are easily recognized and understood. They can be packaged and transported. On the other hand, intellectual products such as survey data or new analytical tools may only be recognized and understood by the people who develop and use them. They are more difficult to package and to trace. Battelle (1973) traced 10 socio-economic innovations and found that basic research provides the origins from which science and technology can advance toward innovations. Only 1 of the 10 innovations studied by Battelle was an intellectual rather than a physical product or process. The intellectual innovation (input-output economic analysis) was first conceived in 1936 but was not accepted widely until

1964. Although there were many related research projects, they culminated in a significant impact only after 28 years. The time for impact of the 10 innovations ranged from 6 to 27 years and averaged nineteen years.

Several studies (Battelle, 1973; Berman & McLaughlin, 1974; Illinois Institute of Technology, 1968; Magisos & Moore, 1977) have observed that measurable or observable changes (impacts) which result from R & D activities are cumulative. Changes which are not statistically significant within five years of implementation may be statistically significant within twenty years and vice versa. Longitudinal studies of such a nature are rarely done. As more time goes by, it becomes increasingly difficult to relate cause and effect because of an increase in the number of intervening variables. It has also been observed that the best time to assess impact varies greatly. It would require tremendous amounts of money and manpower to monitor each of the impacts of a group of related projects for ten or twenty years. Evans (1978) suggested that "instead of running a movie camera until we get what we're looking for" (a statistically significant impact), we might analyze types of physical and intellectual products or processes and learn "when to have the camera there." In spite of these problems, assessment of the impacts of educational R & D activities has been attempted rather frequently during the seventies. Major efforts in this area are reviewed below.

Impact Assessment

The review of literature and ideas on assessing impacts of educational R & D activities is organized to help answer the following ques-

tion: What is educational impact? How can it be recognized, how can it be measured, how can it be predicted, and how can it be facilitated?

What Is Impact and How Can It Be Recognized?

Dick (1976) defined impact as measurable phenomena -- of positive or negative value -- which result from the completion of a project or program. According to Dick, these phenomena (dependent variables) will not occur in the absence of the project or program (independent variable). Miller and Miller (1974) concluded that impact has at least two broad parameters -- intended impact and actual impact. Their concept of impact is distinctly different than Dick's, for it is clear that Dick considered impact to be actual impact. However, both studies described similar methods of assessing impact and emphasized that evaluators need access to data on intended impact in order to find evidence of actual impact.

Stake (1978) and other educational evaluators at the Center for Instructional Research and Curriculum Evaluation (CIRCE) at the University of Illinois concluded that much significant impact in education can be seen but not measured. Using case study methodology, CIRCE has recorded observable and measurable evidence in what they call naturalistic (rather than formalistic) evaluation.

Documentation of the impact which nine cases of basic research have had on educational practice was recently published (Suppes, 1978). All of the cases concerned intellectual rather than physical products. In assessing the impact of the theory of psychoanalysis on American elementary education, the researchers stated that the ideal evidence would have been "data obtained from extensive observations of

elementary school classrooms during the period 1900-1957.[1] However, such data were not available and indirect evidence of impact was sought -- primarily published educational literature. For example, textbooks used in teacher education programs were examined for the number of pages giving coverage to psychoanalysis. The average number of pages for each decade was then calculated and graphed.

Impact of an educational project can thus be considered as the measurable or observable changes/influences (positive or negative) that are intended, immediate and subsequent. These changes/influences could be both quantitative as well as qualitative and relate to the processes, products, inputs and environment of the educational system to which the project is directed. Therefore, a chain of assessment at the planning, formative, summative and subsequent stages of a project must be carried out in order to assess a project's ultimate impact.

An impact which is intended may or may not be realized within a given length of time. Impacts which do occur (actual impacts) may or may not have been intended. The groups impacted may also be intended or unintended. Evidence of impact may be direct (such as in classroom observations) or indirect (such as textbook citations).

Miller and Miller (1974) reviewed over 700 federal and state R & D projects in vocational education and found that most impact statements were of "poor quality." Most evidence cited in the impact statements they quoted had to do with numbers of reports written or disseminated, numbers of copies sold, numbers of inquiries requesting information, or

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[1]The authors stated that this period covered the time from the beginnings of references to psychoanalysis in the American literature until the death of the progressive education movement and the launching of Sputnik.

numbers of students served. There was practically no evidence of measurable change.

Crawford, Kratochvil, and Wright (1972) analyzed 21 exemplary projects in education. Each of the projects was profiled on 54 characteristics. Some of these characteristics had to do with implementation and some had to do with impact. Those which had to do with impact were as follows:

- Percentage of target population at the intended grade level
- Number of field test sites
- Number of students in field tests
- Cost of product per student per year
- Number of reported studies on effectiveness of product on affective gains, cognitive gains, and facilitating gains
- Number of schools in which product is used
- Number of students (in thousands) using product
- Number of states where product is currently used
- Amount of expected use by a specified year

Only 1 of the 21 cases analyzed by Crawford et al. was a vocational education project, "The Cluster Concept." The only impact data reported for it was that its intended target group was 11th and 12th graders, but that only 40% of its actual target group consisted of 11th and 12th graders.

Ramp (1976) attempted to assess impact of 116 projects funded by IOE/DAVTE under the 1968 Vocational Amendments and found that:

- 93% of the projects were "being utilized to some extent at the local, state or national level"
- 40,000 copies of printed project materials had been distributed "to a wide range of educators"
- At least 7,500 persons had visited demonstration projects

- More than 11,000 schools had "in some way been involved" with the 116 projects
- All local vocational directors were aware of at least 2 of the 116 projects
- About 75% of project personnel reported that involvement with funded projects had been beneficial to their careers

COVERD (1976) found that research developed a cadre of researchers: vocational education researchers became better researchers while social science researchers became knowledgeable of vocational education problems. However, few of the latter group continued vocational education research after their initial involvement ended.

Berman and McLaughlin (1974) stressed that in order to show that particular impact would not have occurred in the absence of an R & D activity, evaluators must have data related to the conditions of the target group before and after the R & D activity. Dick (1976) went further. He argued that little evidence of impact would be found if only pre and post measures of summative nature were used. It was Dick's thesis that the impact of summative evaluation is strengthened to the extent that formative evaluation is employed. Dick advocated continuous evaluation of a project and suggested using two evaluators -- one internal and one external. The internal evaluator collects raw data and is part of the project team. He/she should be involved as early as the proposal-writing stage of the project. The external evaluator rarely collects raw data but does examine it for accuracy and reports to the funding agency. Dick pointed out other (more important) functions of the external evaluator. There is a likelihood that the external evaluator will identify problems which have gone undetected by project personnel. Through discussions with a variety of staff and users, he/she can gain a unique perspective on the project and provide insight into difficulties. Often, the external evaluator can informally

suggest alternative solutions which might not otherwise have been considered.

Dick emphasized the importance of evaluators having access to process data, but Miller and Miller (1974) went a step further. They emphasized the need for planning data and concluded that "clear criterion measures" should be established before funding. The developed guidelines for specifying impacts by suggesting that project proposals and reports should routinely include concise listings of:

1. The objectives of the project and a measure of how well those objectives will be (or were) reached.
2. The numbers of schools, staffs, and students who will be (or were) involved and the proportion those are (or were) of the total in the district or state.
3. The previous research which will be (or was) specifically used as a resource for the project.

Miller and Miller concluded that:

> Impact -- actual measurement of change -- should be a required part of all projects, with teeth built in and funding provided. That is, if the impossibility of measuring impact is not agreed upon at the outset of the project, those who proposed the project should be held accountable for impact. They should be penalized when they do not take the time to measure it, or when they were wrong in saying the impact could be measured (p. 59).

De Neufille and Stafford (1971) developed an impact-incidence matrix which was included in Systems Tools for Project Planning (Delp et al., 1977). The matrix provided cells for recording observable (qualitative) as well as measurable (quantitative) data. Also included in the matrix were cells for indicating target groups to be impacted (see Fig. 1).

How can impact be measured?

Actual impact may be assessed at any or all of the following levels where educational impact occurs (Swanson, 1978):

Groups impacted		Impacts			
		Directly estimated $ a_1 a_2 a_3...	Indirectly estimated $ b_1 b_2 ...	Estimated numerically not in $ c_1 c_2 ...	Estimated qualitatively in words d_1 d_2 ...
Directly	A_1 A_2 . . .				
Indirectly	B_1 B_2 . . .				
Special interests	C_1 C_2 . . .				

Figure 1. Impact-Incidence Matrix for Cost Benefit Analysis *

* Systems Analysis for Engineers and Managers by Richard DeNeufville and Joseph H. Stafford. Copyright (c) 1971 by McGraw-Hill Book Company.

- National level (e.g., Congress - educational legislation, USOE - educational funding and regulation)
- State level (e.g., IOE, Assistant Superintendent for DAVTE)
- Regional level (e.g., Director of Area Vocational Center or Technical Institute or President of a Community College)
- Local level (Superintendent of Schools for a Local Education Agency - LEA)
- Unit level (Principal of an LEA school)
- Department level (Chairperson)
- Classroom level (teachers, students)
- Community (parents of students, press, public groups)

Some tangible products of impacts which may be measured and/or observed at these various levels are <u>changes</u> in:

- Capacity
- Actual enrollment
- Attrition
- Organization

  (Capacity, Actual enrollment, Attrition, Organization → number and percentage of client system)
- Attitudes (e.g., acceptance, morale, self-esteem)
- Efficiency (e.g., time required for non-instructional paperwork, time required to complete training)
- Attendance (e.g., less tardiness, fewer absences, less truancy)
- Status (of minorities)
- Achievement
- Knowledge
- Skills
- Costs
- Numbers of requests for (services / products) according to level: (national / classroom)
- Unemployment/underemployment
- Poverty/wages
- Crime, violence, vandalism

Researchers at The National Center for Vocational Education Research (1979) developed a chart which shows types of educational impacts on various groups that might be observed or measured (see Fig. 2).

O'Boyle (1974) pointed out the need for identifying unique criteria for certain types of projects. For example, when evaluating manpower training projects, criteria such as "economically independent" or "employed in the area for which trained" are not as relevant as "having

Group Impacted

TYPE OF IMPACT	SEA/LEA	SCHOOL	STAFF	STUDENT	LOCAL COMMUNITY
Attitude/Policy	Changes in attitude toward females in administrative roles in voc ed	Changes in enrollment policies		Changes in attitude toward voc ed	Changes in community attitude toward voc ed
Knowledge/Skill	Changes in evaluation knowledge and skills		Changes in teachers	Changes in students' occupational competencies	Changes in parents' knowledge of voc ed job options for their children
Behavior/Practice	Changes in state plans	Discard of existing practices	Changes in teaching practices	Greater enrollments/placements of females in non-trained occupational program/jobs	Increased voting for school levies related to voc ed

Figure 2. Potential Indicators of Change*

* The National Center for Research in Vocational Education. Columbus, OH: The Ohio State University, 1979.

earnings which represent at least 60% of a poverty-level income" or "unemployed less than 10 weeks of the year." O'Boyle said that some of the pretraining data which would be necessary for assessing such outcomes are not usually collected and that this problem must be remedied before impact of future manpower programs can be assessed.

Henning (1975) pointed out the effects of research design on impact assessment. He said that quasi-experimental designs have more impact on the present correctional system than do experimental designs. Cheney-Stern (1977) used a quasi-experimental design to assess the impact of career education on career maturity of male convicts in an Illinois State prison. She found that prisoners who completed a career education course had about twice the gain in career maturity that a comparable non-treatment group had over the same period of time.

The National Council on Employment Policy (1976) pointed out the need for assessing the duration of impact. They concluded that high initial costs of a project or program may be justified by impacts (gains) which remain constant over time. Malhotra (1978) suggested that assessment of actual impact be divided into "immediate" and "subsequent." For example, a responsibility of each funded project would be to specify its intended outcomes (impact) and account for its immediate outcomes. However, a State's funding agency would assess sustained and/or subsequent impact of a project or a group of related projects. Cheney-Stern and Evans (1979) concluded that this type of longitudinal impact assessment would require continuity in impact specifications for all projects funded by the same agency.

How can impact be predicted?

Several studies have identified characteristics associated with high versus low impact projects (Battelle, 1973; Illinois Institute of Technol-

ogy, 1968; Moore & Magisos, 1977; McCaslin, 1978; Murphy, 1974). The PROJECT IMPACT staff reviewed and synthesized these characteristics and found that many were extrinsic to the idea of a project. For example, motivational factors, management factors, or even accidental factors intruded. From this list, Malhotra (1978) developed a "Rating Form of Success Factors for Predicting Impact of an Educational R & D Project" (see Appendix B).

How can impact be facilitated?

Studies by Battelle-Columbus Laboratories (1973), the Illinois Institute of Technology Research Institute (1968), Miller and Miller (1974), and Suppes (1978) have all pointed to the need for research programs which form a coherent whole. There should be continuity between basic, applied, and developmental research. Miller and Miller studied over 700 federal and state R & D projects in vocational education and concluded that problems were inadequately investigated before (assumed) solutions to problems were designed and demonstrated. Cheney-Stern and Evans (1979) discussed the effects of "continuity" on impact. For example, impact is likely to be facilitated if there is continuity of effort on the part of researchers, continuity of goals and funding on the part of organizations which fund research, and continuity of reporting successful research results to consumers. "Brainstorming" sessions which were held during the early months of PROJECT IMPACT identified the following list of impact factilitators:

- The quality and quantity of the final report
- The method of dissemination
- The timing of dissemination
- The target groups for dissemination
- The length of the project
- The risk of the project (e.g., low risk projects are usually low impact projects)

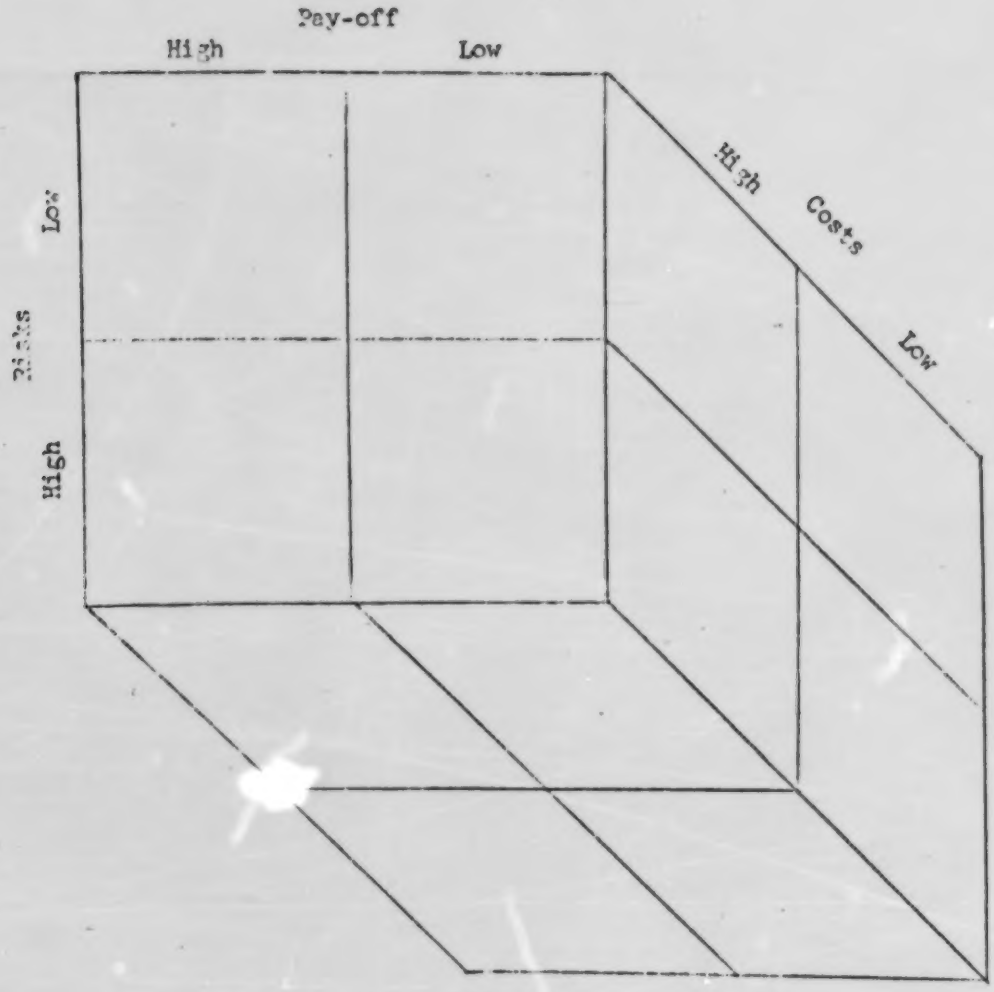
- The availability of funding
- The cost of the project
- The personalities of project personnel and disseminators
- The reward system (reinforcers or contingencies associated with adoption)

Copa (1978) suggested that impact might be facilitated if research investment patterns matched the service delivery systems. He pointed out that for the past 10 years, the investments in vocational education R & D activities have been in across-the-board (handicapped, disadvantaged, etc.) rather than subject-matter specialties (agriculture, business, health, home economics, etc.) which actually deliver vocational education.

Use of the "portfolio theory" to facilitate impact of an entire R & D program rather than a project-by-project approach was suggested by PROJECT IMPACT staff members. For example, a mix of projects which were low or high in probable costs, risks and pay-offs might produce greater impact than a portfolio of projects, all of which were low in risk and high in cost and pay-off. The staff developed a matrix for classifying projects according to this scheme (see Fig. 3).

Summary

Vocational education R & D activities which result in changes in vocational education are said to have had "impact." Evidence of impact may be direct or indirect. The time between cause and effect of impact is longer for intellectual products than for tangible products. Because of a mutation phenomenon which occurs when R & D projects are adapted, it is desirable to assess impact of a project (or a group of related projects) at the school district (LEA) level rather than at regional, state or national levels.



Place projects A, B to n in the eight cells named below.

	Risk	Pay-off	Cost	Name of Project
1	L	H	L	
2	H	H	L	
3	L	H	H	
4	H	H	H	
5	L	L	L	
6	H	L	L	
7	L	L	H	
8	H	L	H	

Figure 3. Project Classification Guide

Numerous characteristics which are associated with high versus low impact have been identified by researchers in vocational education and other fields. The degree to which these characteristics are present or absent may be useful in predicting actual impact.

One of the greatest facilitators of R & D impact is a program which has a coherent whole. Basic and applied research need to be funded adequately and carried out before developmental products or processes are attempted.

In order to avoid an overconcentration on low risk, low pay-off, high cost projects, assessment of impact of research projects should be aggregated at the program level, rather than judged solely project-by-project. Assessment of actual impact of a project (or group of related projects) is dependent on availability of planning and process data such as specifications of intended outcomes (impact). If cumulative impact (over time or geographic area) is to be assessed, it will be facilitated by the use of a standardized format for specifying intended and actual impacts for all projects funded by the state agency.

Chapter 3

Review of Literature on Case Study Methodology and Details of PROJECT IMPACT's Methods

A case study is "the examination of an instance in action" (Walker, 1974). The purpose of a case study is to enable the researcher to make generalizations from the instance studied to the class it purports to represent, to make generalizations from features of the instance to a multiplicity of classes, or to make generalizations about only the instance studied (Adelman, Jenkins & Kemmis, 1975). A variety of techniques (most of which have been developed by sociologists) is employed in the case study method.

Steps which are usually included in case study procedure are as follows:

- Defining the problem
- Reviewing research related to the problem
- Developing objectives for the study
- Selecting the field setting(s)
- Making initial field contacts
- Gathering quantitative and qualitative data (e.g., data on the setting and participants, data from documents, data from interviews and questionnaires)
- Coding and analyzing materials
- Reporting findings
- Developing and validating propositions
- Drawing conclusions from the study

Case study methods allow a wide variety of reporting forms such as collage, film documentary, mixed-media presentations, role-play simulations, oral feedback, quasi-journalistic reports, as well as the more usual written reports (Adelman et al., 1975). Stake (1978) distinguished a case study project (the persistent study of a single case) from the multiple case study project (a collection of individual case studies). He stated that special research procedures are needed for

the multiple case study project, but that, unfortunately, they are not well developed. Stake also pointed out that multiple case study projects "demand a form of linkage -- a manner in which to discuss their differences and similarities," but that the topic is little examined in the methodological literature.

The case study literature does describe a validation technique called "triangulation" (Center for Instructional Research and Evaluation, 1978). The idea comes from sociology and navigation and it has to do with arriving "at the same meaning by at least three independent sources." A controversial finding based on several accounts has more credibility than if it had been based on only one account. Therefore, corroboration is usually desirable.

Ethical practices which are common in case studies are anonymity of sites and persons and confidentiality of information. These practices provide legal protection to case study researchers as well as privacy to individuals and institutions. Therefore, towns, schools and people are usually given fictitious names in case studies. Clearance procedures are often required at the time field contacts are made. For example, any research activity within a school district may have to be approved by the Superintendent of Schools before any interviews with school personnel may be scheduled or before any documents may be released.

Crawford et al. (1972) at the American Institutes of Research (AIR) developed criteria for case selection from a variety of educational R & D activities. One hundred and seventeen exemplary products or processes which met the criteria were identified, and twenty-one were selected for an impact study. Six procedural steps were developed for the multiple case study project and are summarized below:

- Collect data on the origin of the idea for the product (or process).

- Collect data on the design and conceptualization of the product (or process).

- Collect data on the history of the development of the idea into a product (or process), including the source of support and the identity of the developers.

- Collect data on pilot and field testings of the product (or process), and the results of such analyses.

- Collect data on the efforts in dissemination of information about the product (or process).

- Collect data which might serve as direct or indirect measures of the impact of the product (or process) in its operational form (e.g., the number of students involved, the number of items sold, surveys of student and/or teacher reactions, and summaries of evaluative studies).

It was suggested by Crawford and his staff at AIR that data be collected by (1) identifying, retrieving and reviewing documents (e.g., letters, proposals, budgets, progress reports, final reports, brochures, and lists of workshop participants) and (2) interviewing key people in person and/or by telephone and taperecording each interview. In considering the best approach to reporting and collected data, Crawford et al. decided that each developed case study would include four components:

- A systematic narrative history based on a master outline which included sections for a general description of the product (or diffusion, its adoption, and its future.)

- A data record consisting of a systematic coded matrix of quantifiable aspects of products (or processes). Information in the matrix was "arranged and coded for possible keypunching and machine treatment of the data."

- A description of critical decisions in the history of the product (or process). These descriptions included the decisions that had to be made, the alternatives available for each decision, the alternative selected, the forces leading to the selection of a particular decision, and the consequences resulting from the selected alternative.

- A chart or diagram which provided an overview of the major events in the history of the product (or process).

Crawford and his staff generally completed a rough draft of the narrative outline before site visits were made. Analysis of documents provided the information for these drafts. The interviews were used to verify the information and to fill in gaps in the outline of the draft.

McCaslin, Adams, and Gross (1976) studied characteristics of higher versus lower impact projects conducted by Kentucky's Research and Development Unit from 1967 to 1975. In their multiple case study project they developed and used three forms for collecting data -- one for describing the R & D project, one for interviewing the director and/or the principal investigator of the project, and one for obtaining information from project participants.

Miller and Miller (1974) developed a series of matrices for analyzing impacts. They compared intended versus actual impacts, funding levels, and types of problems for over 700 federal and state R & D projects in vocational education.

Delp, Thesen, Motiwalla, and Seshadri (1977) cited an "impact-incidence matrix" which was developed by De Neufille and Stafford in 1971. The matrix, which provided cells for recording both quantitative and qualitative data as well as information on the groups targeted for impact, was described earlier in this report (see Fig. 1, p. 21).

Although there is not a well-defined methodology for conducting multiple case study projects in general, there are some precedents in the field of education -- especially vocational education. After identifying and evaluating the case study procedures and tools which were available, the PROJECT IMPACT staff decided to adopt or adapt some of

them for gathering and recording data on their four case studies. The adoptions and adaptations were as follows:

- Establish case criteria and select cases from the nominations of Advisory Committee members and consultants. (Criteria for case selection were established in the project proposal which is contained in Appendix A and the "Advisory Committee Questionnaire" for case nomination is contained in Appendix C.)

- Collect data according to the six procedural steps described by Crawford and his staff at AIR for "top-down" tracking of cases but reverse the steps for "bottom-up" tracking.

- Prepare a draft of a narrative record for each case by using an adaptation of AIR's "Master Outline" (see Appendix D).

- Conduct interviews using the narrative draft and/or the Kentucky forms for project directors and project participants as guides. (Copies of the "Project Director Interview Schedule" and the "Participant Questionnaire" are contained in Appendices E and F respectively).

- Arrange and code quantitative and qualitative impact data on an adapted form of the matrix developed by De Neufille and Stafford (see Fig. 4).

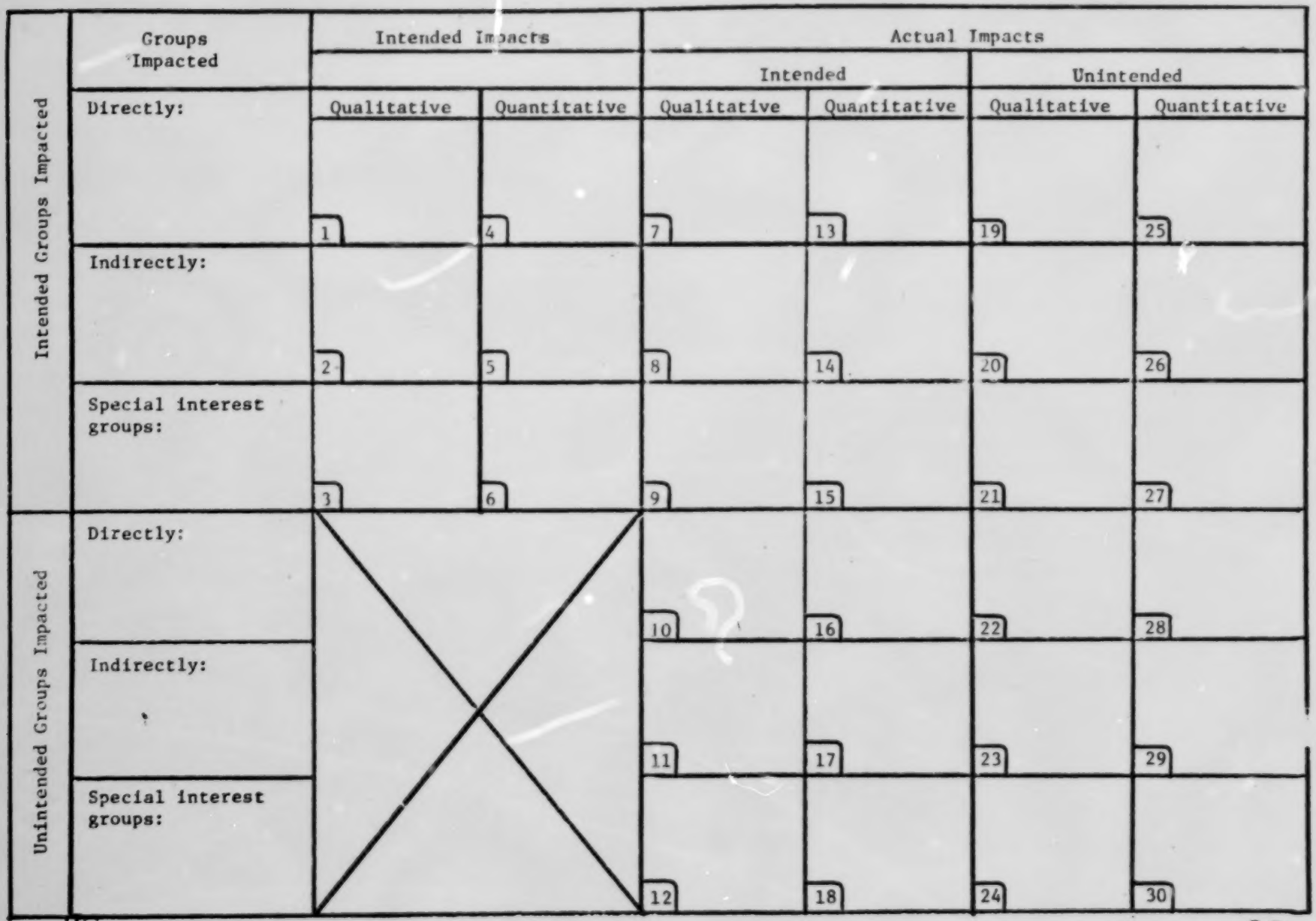
- Describe the critical decisions in the history of the case as suggested by the AIR researchers and corroborate data with two or more interviews.

- Chart or diagram an overview of the major events in the history of the case.

In addition to using these adopted and adapted methods and tools, each tracking manager kept a detailed log of events regarding his/her case study. The principal investigator also kept a log on the activities of the over-all project.

The results of case nomination, selection, and reporting procedures are presented below.

The questionnaire which was developed for nominating cases for this study was mailed to each member of the Advisory Committee and was circulated among the project consultants and staff. Most responses to the questionnaire were received in person or by phone rather than



Impact Specification Matrix

in writing. Most respondents nominated cases in only one or two categories (rather than all five). "A Research and Development Project in Occupational Education" (The Illinois Occupational Curriculum Project -- IOCP) and "The Illinois Network of Exemplary Occupational Education Programs for Handicapped and Disadvantaged Students" were most frequently nominated and were selected by project staff for top-down tracking. Nomination and selection of cases for bottom-up tracking proved to be more difficult. The staff and consultants decided that a group of related projects should be identified for each of these cases. Because "IOCP" was targeted primarily on administrators, and "The Network" was targeted primarily on teachers, it was decided that a criterion for selecting the two "bottom-up" cases should be that their primary targets be students or both teachers and students. Another suggested criterion was that one of these cases should be closely related to a subject-matter specialty as opposed to an "across-the-board" area. After considerable deliberation, the staff selected "Projects in Horticulture" and "Career Education Projects at the Awareness Level." It was noted that the horticulture projects were targeted primarily on teachers and students at secondary or post-secondary school levels while the career education projects being studied were targeted primarily on teachers and students at the elementary school level.

A tracking manager was assigned to each case to identify, retrieve and analyze documents pertinent to her/his case. Manager of top-down case studies analyzed project proposals and reports before they interviewed staff members or reviewed products of the projects in their cases. Managers of bottom-up case studies familiarized themselves with products of projects before interviewing people who were likely to have

adopted the products. By having done so, they were able to identify curriculum materials or methods (or other products) which were being used by teachers without having to ask teachers about particular projects or products by name.

The following six steps were taken to continue each case study, but were done in reverse order to tracking from the bottom up:

- Data on the origin of the idea for the product (or process) were collected.
- Data on the design and conceptualization of the product (or process) were collected.
- Data on the history of the development of the idea into a product (or process) were collected.
- Data on pilot tests, field tests and other formative evaluations were collected.
- Data on dissemination efforts were collected.
- Data on adoption and summative evaluations (especially impact measures) were collected.

After completing the above steps for her/his case, each manager investigated the future of the case, drew conclusions about the case, and made recommendations regarding further impact investigations of the case.

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Appendix A

The Initial Project Proposal for

"Development of Procedures for Assessing the Impact of

Vocational Education Research and Development on

Vocational Education Programs"

Research programs are expensive. They require the use of resources which are needed elsewere, and they can be justified, in the long run, only if they increase knowledge. Programs of vocational education research and development, because of their relationship to vocational education, require a further justification: they must be judged in terms of extent to which they have improved the quality of vocational education service. In other words,they must be judged to havehad impact upon (and to have changed the behavior of) those who deliver vocational education services. If the program has no impact on vocational education, and vocational educators, it does not warrant continued support from vocational education funds.

A research and development program is composed largely of projects. These relatively independent and self-contained research or development activities can be characterized in a variety of ways: low-high risk, low-high probable payoff, basic-applied, descriptive-experimental, etc. Obviously, the probability of impact from a high-risk, high payoff project is relatively low, but if it does pay off, it will have far-reaching effects. If one knew in advance what would be accomplished by a project, it would not be necessary, in many cases, for the project to be undertaken at all. Unfortunately, some evaluators of research attempt to apply the "impact" test to each project, when it properly should be applied only to a program. For example, the Con-

gress (in Public Law 94-482, Title II, Section 202) amended Section 103 of the Vocational Education Act of 1963 to require each research contract to include demonstration of reasonable probability of ". . . improved teaching techniques or curriculum materials that will be used in a substantial number of classrooms or learning situations within five years . . ." In other words, each research and development contract must have a probability of impact on vocational education teaching and learning.

Whether or not one agrees with this Congressional mandate, it is, in fact, the law. Managers of research programs, therefore, are faced with the necessity of assessing the probability that impact will occur, and the moral obligation of measuring the actual impact of at least a sample of completed research and development projects. This latter should be done, in any case, in order to assess the impact of the research and development program.

As is often the case, these necessities and obligations are easier to state than to do. Three major problems exist: how to define impact, how to assess it, and how to show a cause and effect relationship between project activities and changes in the vocational education teaching-learning situations. Subsidiary problems include: how to predict probability of impact, and how to manage on-going contracts to increase the probability of impact. This project is concerned with the three major problems, but it is believed that some suggestions related to the two subsidiary problems will emerge.

Procedure

1. Review literature on impact of research and development and its measurement.

2. Interview key personnel to identify ways now used to assess effectiveness (including impact) of educational research and development programs and projects in Illinois. They will also be asked about effectiveness of current methods, about other methods which might be used, and reasons why some of these methods have not been used. Persons to be interviewed will include: administrators and managers of educational R & D programs in IOE, in universities, in community colleges and in K-12 school districts; evaluators of educational programs and projects in Illinois.

3. A series of one-day brainstorming sessions will be conducted to get ideas of how to attack the three major problems outlined above. Groups will be small (3-5 persons per group), and will include representation from sociology, economics, philosophy, statistics, advertising, health, education, psychology, business management. Persons from the above disciplines who have worked on the following topics will be invited: causation, effectiveness, dissemination, adoption, institutional change, personal change, innovation, research management and organization, hypothesis formation and testing, readership, sales volume, assessment, evaluation, satisfaction, confidence testing, accountability. Persons to be invited will be identified (a) by the advisory committee, (b) through the literature search, and (c) through nomination by the persons identified in steps 4 (a) and 4 (b).

4. Two major types of research project tracking will be done, one from the bottom up, and one from the top down:

a) Four major recent changes in vocational education teaching and learning in Illinois at the LEA level will be identified. One of these will be related to curriculum materials production, e.g., IACP

Industrial Arts or nutrition education. The second will be related to vocational education of a new target group, e.g., the handicapped or incarcerated offenders. The third will be related to new concepts of organization for vocational education, e.g., area vocational schools or CETA-YEDPA. The fourth will be related to changes in school goals, e.g., career education or school-operated placement services. The project advisory committee will recommend specific programs in each category and may recommend changes in categories. For each type of change, the determinants of change will be identified through interviews with major change agents nominated by current actors, so that each actor will identify the person, event, material, or other occurrence which affected her/his actions. In this way a chain of occurrences will be identified. If research results are a part of the chain, this will be noted, and its relative significance in the chain will be assessed.

b1) Vocational education research and development administrators in Illinois will be asked to nominate the project(s) with which they were involved which had the most impact on vocational education teaching and learning. Administrators of research programs in IOE and universities will be included. A maximum of four projects will be selected, and by means of interviews with the principal actors, a chain of effects will be identified. In each case the actor will be asked who and what affected her/his actions, and who or what was affected by the actor. The point at which knowledge of the research base was lost will be noted.

b2) Nominations will be sought (from this same group of administrators) of projects and programs which had strong potential for impact, but the predicted impact did not occur. A chain of actions will

be constructed, and the point at which the chain was broken will be noted and an assessment made of reasons for the break.

5. Case studies of projects and programs will be prepared identifying:

   a. measures of impact

   b. factors facilitating and hampering impact

   c. factors facilitating and hampering recognition of impact

   d. factors facilitating and hampering linkages from one level to another

6. Tentative recommendations will be prepared for research administrators suggesting means of:

   a. assessing potential impact

   b. assessing actual impact

   c. facilitating impact

   d. facilitating recognition of impact

7. A conference of administrators, producers and consumers of vocational education research and development will be convened. They will be asked to review the case studies and tentative recommendations and to suggest modifications.

8. Case studies and recommendations will be revised and disseminated as:

   a. a monograph with executive summary

   b. a journal article suitable for publication in the Journal of Vocational Education Research

   c. a proposed oral presentation to the RCU Directors and the American Vocational Association

Project Professional Staff

Project Director, Dr. Rupert N. Evans Professor, Department of Vocational and Technical Education, University of Illinois, Urbana-Champaign.

Principal Investigator, Dr. Marilyn Cheney-Stern, Visiting Assistant Professor of Vocational and Technical Education.

Appendix B*

Rating Form of Success Factors for Predicting

Impact of an Educational R & D Project

	0	1	2	3
A. Motivational Influences				
1. Motivation for the timely acquisition of the fundamental knowledge useful for application in the project.				
2. Motivation for the timely improvement of an existing product or process.				
3. Motivation for solving the problem or meeting the needs.				
4. Estimates of the potential market for the project/innovation.				
B. Planning				
1. Provision for ongoing and end evaluation of project effectiveness on the basis of objective data.				
2. Involvement of participants from the different client organizations more fully in project planning.				
3. Accessibility of planning documents such as PERT or time effort charts and objectives.				
4. Development and demonstration activities supported by research activities in the plan.				
5. Planning for more final evaluations of the project.				
6. Fixation of priorities for attainment of objectives.				
7. Provision for dissemination and utilization of project results.				
8. Provision for staff development of the client organizations.				
9. High relationship between objectives and performance activities planned.				

*Developed by M. M. Malhotra for PROJECT IMPACT (1979).

0 1 2 3

10. Development of materials for use at the place of client organizations.

11. Consideration for manpower requirements for implementation.

12. Provisions for clear practical guidelines, delegation of authority and making available support to the client organizations by the parent organization.

13. Project planning based on need assessment and priorities of these needs.

14. Criterion standards established for evaluation of the project.

15. Establishment of information system in the planning.

16. Participation of project staff in stating project goals and their perceived importance.

17. Suggestion of goals and approaches by persons outside the project team.

C. Management

1. Earlier activities that established the practicability of further development or the utility of further research.

2. Provision for adequate orientation for participants concerning their role in the project.

3. Provision for adequate facilities for implementing the project effectively.

4. Coherent research and development strategy with central unifying thrust.

D. Staff

1. Provision of staff for identification of scientific or technical information of relevance to the interests and activities of researchers.

2. Project sponsored by organzation having prior experience of conducting research and development projects OR skills, commitment

0 1 2 3

and flexibility of the project team and their participation in project decisions.

3. Use of more part-time project staff.

4. Project manager's skills, commitment and participation in setting goals.

E. Accidental Factors

1. Merger of major channels of development often from diverse scientific fields, making possible new advances.

2. Close working relations of the client organizations with the project.

Appendix C

Advisory Committee Questionnaire

The attached five pages have been provided to facilitate the nomination process for PROJECT IMPACT. Nominations for case studies will be reviewed in order to select four cases to track for effectiveness or impact.

We have suggested four categories for case nomination and provided one page for each. We would like to have your recommendations for additions or substitutions in these suggested categories and we have provided a fifth page for that purpose.

It might be helpful for you to review the project description that we sent you in August before completing the questionnaire and ask yourself, "What projects, surveys, changes or events have taken place in Illinois which would be worthwhile case studies in terms of investigating impact?"

Please return only the five "Category Pages" to us in the enclosed envelope.

Thank you,

PROJECT IMPACT

PROJECT IMPACT

Category I: Illinois Curriculum Materials Production

1. What was the product?

2. Where was it produced?

3. When was it produced?

4. Who were the key people involved in the production (please give names, addresses, and phone numbers if possible)?

5. Would you say that this case was an example of (please check one):

   high risk _____ low risk _____

6. Would you say that this case was an example of (please check one):

   high cost _____ low cost _____

7. Would you say that this case was an example of (please check one):

   high pay-off where high pay-off was expected _____
   high pay-off where low pay-off was expected _____
   low pay-off where high pay-off was expected _____
   low pay-off where low pay-off was expected _____

Comments:

PROJECT IMPACT

Category II: Vocational Education of a New Target Group, in Illinois (e.g., handicapped or incarcerated)

1. What was the program, project, survey or event?

2. Where did it occur?

3. When did it occur?

4. Who were the key people involved in the production (please give names, addresses, and phone numbers if possible)?

5. Would you say that this case was an example of (please check one):

   high risk _____ low risk _____

6. Would you say that this case was an example of (please check one):

   high cost _____ low cost _____

7. Would you say that this case was an example of (please check one):

   high pay-off where high pay-off was expected _____
   high pay-off where low pay-off was expected _____
   low pay-off where high pay-off was expected _____
   low pay-off where low pay-off was expected _____

Comments (use reverse side if necessary):

PROJECT IMPACT

Category III: New Concepts of Organization for Vocational Education in Illinois (e.g., area vocational schools, CETA-YEDPA)

1. What was the change?

2. Where did it occur?

3. When did it occur?

4. Who were the key people involved in the production (please give names, addresses, and phone numbers if possible)?

5. Would you say that this case was an example of (please check one):

   high risk _____ low risk _____

6. Would you say that this case was an example of (please check one):

   high cost _____ low cost _____

7. Would you say that this case was an example of (please check one):

   high pay-off where high pay-off was expected _____
   high pay-off where low pay-off was expected _____
   low pay-off where high pay-off was expected _____
   low pay-off where low pay-off was expected _____

Comments (use reverse side if necessary):

PROJECT IMPACT

Category IV: Changes in School Goals (e.g., career education, school-operated placement programs)

1. What was the change?

2. Where did it occur?

3. When did it occur?

4. Who were the key people involved in the production (please give names, addresses, and phone numbers if possible)?

5. Would you say that this case was an example of (please check one):

   high risk _____ low risk _____

6. Would you say that this case was an example of (please check one):

   high cost _____ low cost _____

7. Would you say that this case was an example of (please check one):

   high pay-off where high pay-off was expected _____
   high pay-off where low pay-off was expected _____
   low pay-off where high pay-off was expected _____
   low pay-off where low pay-off was expected _____

Comments (use reverse side if necessary):

PROJECT IMPACT

Category V: (This category is open for you to substitute or add to the suggested ones. In your comments below please indicate if your recommendation is to add the fifth category or to replace I, II, IIII or IV.)

1. What was the change?

2. Where did it occur?

3. When did it occur?

4. Who were the key people involved in the production (please give names, addresses, and phone numbers if possible)?

5. Would you say that this case was an example of (please check one):

   high risk _____ low risk _____

6. Would you say that this case was an example of (please check one):

   high cost _____ low cost _____

7. Would you say that this case was an example of (please check one):

   high pay-off where high pay-off was expected _____
   high pay-off where low pay-off was expected _____
   low pay-off where high pay-off was expected _____
   low pay-off where low pay-off was expected _____

Comments (use reverse side if necessary):

Appendix D

Master Outline for PROJECT IMPACT Case Studies

PRODUCT DESCRIPTION

1.1 Product Characteristics

1.1.1 Name

1.1.2 Developer

1.1.3 Distributor

1.1.4 Focus

1.1.5 Grade Level

1.1.6 Target Population

1.1.7 Costs

1.2 Rationale for Product

1.2.1 Long Range Goals of Product

1.2.2 Objectives of Product

1.2.3 Philosophy Behind Product

1.2.4 Theories Supporting Product

1.3 Description of Materials

1.3.1 Organization of Materials

1.3.2 Format of Materials (how physically presented)

1.3.3 Content of Materials (concepts and terminology covered, etc.)

1.3.4 Cost of Materials to User

1.4 Procedures for Using Product

1.4.1 Learner Activities

1.4.1.1 Relationship to program objectives

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* Adapted from Crawford et al. (1972) at the American Institute of Research.

1.4.1.2 Typical activities in a day

1.4.1.3 Group and individual activities

1.4.1.4 Kinds of practice, review and feedback

1.4.1.5 Recommended period of use

1.4.1.6 Provisions for motivating student

1.4.2 Teacher Activities

1.4.2.1 Teacher strategy

1.4.2.2 Teacher training

1.4.2.3 Out-of-class preparation

1.4.3 Provisions for Parent/Community Involvement

1.4.3.1 Special Physical Facilities or Equipment

1.4.3.2 Recommended Assessment Techniques for Users (e.g., criterion-referenced, tests, etc.)

2.0 ORIGINS

2.1 Key Personnel

2.1.1 Education and Experience of Key Personnel

2.1.2 Philosophy of Key Personnel

2.1.3 Relevant Research Conducted by Key Personnel

2.2 Sources of Ideas for Product

2.2.1 Trends of the Time

2.2.2 Relevant Research

2.2.2.1 Theory

2.2.2.2 Techniques

2.2.3 Technological Prerequisites

2.2.4 Similar Products

2.3 Evolution of Idea for Product

2.3.1 Formulation of Ideas for Product (Note when, by whom, why, how, in what form?)

2.3.2 Changes in Ideas for Product (Note when, by whom, why, how, in what form?)

2.3.3 Factors Which Stimulated Development of the Idea

2.3.3.1 Efforts of a key person or persons

2.3.3.2 Available funding

2.3.3.3 Need for the product (Note how need was defined, assessed and documented.)

2.3.3.4 Potential effectiveness and feasibility of product

2.3.3.5 Motivation to produce product

2.4 Funding for Product

2.4.1 Initial Efforts to Fund Products

2.4.2 Contacts with Funding Sources

2.4.3 Factors Influencing Funding Sources

2.4.4 Preparation of Proposals

2.4.5 Details of Funding Agreement

2.4.6 Description of Funding Sources

2.4.7 Breakdown of Funds (by stages of development, categories of use, and/or components)

3.0 PRODUCT DEVELOPMENT

3.1 Management and Organization

3.1.1 Characteristics of Development Agency (Note major funding source, age, other projects, number and qualifications of staff, organizational structure)

3.1.2 Relationship of This Product to Agency (Note proportion of resources, people and facilities devoted to product)

3.1.3 Other Agencies Involved in Development

3.1.3.1 Characteristics of other involved agencies

3.1.3.2 Relationship to primary developer (Note division of responsibility, channels of communication, procedures for decision making)

3.2 Original Development Plan

3.2.1 Objectives

3.2.2 Description of Expected Product

3.2.3 Procedures for Product Development

- 3.2.3.1 Organization
- 3.2.3.2 Tasks
- 3.2.3.3 Personnel
- 3.2.3.4 Time schedule

3.2.4 Planned Procedures for Product Evaluation

- 3.2.4.1 Formative evaluation plans
- 3.2.4.2 Summative evaluation plans
  - 3.2.4.2.1 Modifications of Original Development Plan

3.2.5 List and Description of Modifications

3.2.6 Reasons for Making Modifications

3.2.7 Brief Comparison of Planned Development with Actual Development

- 3.2.7.1 Actual procedures for development of product (For each stage/phase of development note the following information)

3.2.8 Development Staff (Note size, education, experience, special qualifications, organizational structure, problems in recruiting and maintaining.)

3.2.9 Patterns of Interaction (Note channels of communication between staff, general interpersonal relationships.)

3.2.10 Development

- 3.2.10.1 Activities and tasks
- 3.2.10.2 Procedures followed (Note effective and not so effective ones.)
- 3.2.10.3 Bottlenecks and problems
- 3.2.10.4 Major decisions (Note procedures for making decisions.)

3.2.11 Formative Evaluation

3.2.11.1 Conditions of formative evaluation (Note when, by whom, with whom.)

3.2.11.2 Procedures followed in formative evaluation

3.2.11.3 Techniques used to gather information

3.2.11.4 Procedures for modifying product on the basis of formative evaluation results

3.2.11.5 Nature and extent of modifications

3.2.11.6 Number and description of formative evaluation cycles

3.2.12 Other Formative Evaluation (Note when, by whom, with whom.)

3.2.12.1 Conditions of evaluation (Note when, by whom, with whom.)

3.2.12.2 Procedures followed

3.2.12.3 Techniques used to gather information

3.2.12.4 Procedures for modifying product on the basis of evaluation results

3.2.12.5 Nature and extent of modifications

3.2.12.6 Number and description of iterative cycles

3.2.12.7 Development of Performance Measures/Assessment Techniques (For each stage/phase of development note the following types of information.)

3.2.13 Development Staff (Note size, education, experience, special qualifications, organizational structure, problems in recruiting and maintaining.)

3.2.14 Patterns of Interaction (Note channels of communication between staff, general interpersonal relationships.)

3.2.15 Development

3.2.15.1 Activities and tasks (Note research on available techniques, adaptation of techniques to product, expansion of techniques.)

3.2.15.2 Procedures followed (Note effective and not so effective ones.)

3.2.15.3 Bottlenecks and problems

3.2.15.4 Major decisions (Note procedures for making decisions.)

3.2.16 Formative Evaluation of Assessment Techniques

3.2.16.1 Conditions of evaluation (Note when, by whom, with whom.)

3.2.16.2 Procedures followed

3.2.16.3 Techniques used for gathering information

3.2.16.4 Procedures for modifying assessment techniques

3.2.16.5 Nature and extent of modifications

3.2.16.6 Number and description of evaluation cycles

3.2.17 Other Formative Evaluation of Assessment Techniques (e.g., note field tests, etc.)

3.2.17.1 Conditions of evaluation (Note when, by whom, with whom.)

3.2.17.2 Procedures followed

3.2.17.3 Techniques used for gathering information

3.2.17.4 Procedures for modifying assessment techniques

3.2.17.5 Nature and extent of modifications

3.2.17.6 Number and description of evaluation cycles

4.0 SUMMATIVE EVALUATION

4.1 Evaluation Staff

4.1.1 Relationships to Development Staff

4.1.2 Size

4.1.3 Education, Experience, Special Qualifications

4.1.4 Hierarchy and Organizational Structure (Note interpersonal relationships.)

4.1.5 Problems in Recruiting and Maintaining Staff

4.2 Field Tests

(For each field test note the following types of information)

4.2.1 Designer of Field Test (Note who and when.)

4.2.2 Funding

4.2.3 Coordinator of Field Test (Note who, relationship to developing and funding agencies)

4.2.4 Subjects

4.2.4.1 Number (students, schools, classes or teachers)

4.2.4.2 Geographical distribution

4.2.4.3 Socio-economic description

4.2.4.4 Selection process (Note schools or districts and experimental and control groups.)

4.2.5 Treatments

4.2.5.1 Experimental treatments

4.2.5.2 Control treatment

4.2.6 Measures

4.2.6.1 Description of measures (Note standardized tests, staff constructed tests, questionnaires, structured observations, school visits, etc.)

4.2.6.2 Rationale for measures employed

4.2.6.3 Procedures for administration

4.2.7 Results of Field Test

4.2.7.1 Analyses used

4.2.7.2 Rationale for analyses

4.2.7.3 Student cognitive changes

4.2.7.4 Student affective changes

4.2.7.5 Changes in facilitating factors

4.2.7.6 Unanticipated changes

4.2.7.7 Documentation and reporting of results

4.2.8 Modifications Made in Product

4.2.8.1 Procedures for modifying product on the basis of field test results

4.2.8.2 Nature and extent of modifications in product

4.3 Other Summative Evaluations

(e.g., those conducted by the users)

4.3.1 Designer of Evaluation Program (Note who and when.)

4.3.2 Funding

4.3.3 Coordinator (Note who, relationship to developing and funding agencies.)

4.3.4 Subjects

- 4.3.4.1 Number (students, schools, classes or teachers)
- 4.3.4.2 Geographical distribution
- 4.3.4.3 Socio-economic description
- 4.3.4.4 Selection process (Note schools or districts and experimental and control groups.)

4.3.5 Treatments

- 4.3.5.1 Experimental treatments
- 4.3.5.2 Control treatments

4.3.6 Measures

- 4.3.6.1 Description of measures (Note standardized tests, staff constructed tests, questionnaires, structured observations, school visits, etc.)
- 4.3.6.2 Rationale for measures employed
- 4.3.6.3 Procedures for administration

4.3.7 Results of Evaluation

- 4.3.7.1 Analyses used
- 4.3.7.2 Rationale for analyses
- 4.3.7.3 Student cognitive changes
- 4.3.7.4 Student affective changes
- 4.3.7.5 Changes in facilitating factors
- 4.3.7.6 Unanticipated changes
- 4.3.7.7 Documentation and reporting of results

4.3.8 Modifications Made in Product as a Result of Evaluation Results

4.3.8.1 Comments on the adequacy of the evaluations

5.0 DIFFUSION

5.1 Agency Participation

5.1.1 Agencies Involved (Note characteristics.)

5.1.2 Relationships Among Agencies

5.1.3 Dissusion Activities of Each Agency (Give brief descriptions.)

5.2 Diffusion Strategy

5.2.1 Developer of Plans/Strategy

5.2.2 Outline of Strategy

5.2.2.1 Target

5.2.2.2 Techniques for reaching target

5.3 Actual Diffusion Efforts

5.3.1 Activities (list, describe, when, by whom)

5.3.2 Responses to Diffusion Efforts

5.3.2.1 Indications of interest

5.3.2.2 Early users

5.3.3 Revisions in Diffusion Strategy (Describe and give rationale for making revisions.)

5.4 Product Characteristics and Other Factors Affecting Diffusion

5.4.1 Complexity of Product

5.4.2 Divisibility of Product

5.4.3 Compatibility of Product with Other School Practices

5.4.4 Teacher Training Required

5.4.5 Ease with Which Product Can be Communicated

5.4.6 Comparison with Other Products

5.4.7 Economic Conditions and Attitudes of the Times

5.4.8 Cost of Product

5.4.8.1 Start-up costs

5.4.8.2 Continuation costs

5.4.8.3 Alternative products

6.0 ADOPTION

6.1 Extent of Product Use

(Differentiate between field tests, try outs and adoption)

6.1.1 Location of Users (Note geographic distribution.)

6.1.2 Number of Users (Note how many students, schools, number of copies sold, etc.)

6.1.3 Socio-Economic Characteristics of Users

6.1.4 Length of Time in Use

6.1.5 Initiation of Adoption

6.1.6 Relationship Between User and Developer and/or Distributor

6.2 Installation Procedures

6.2.1 Necessary Physical Arrangements or Equipment

6.2.2 Necessary Classroom Organization

6.2.3 Importance of Teacher Training

6.2.3.1 Availability of training programs

6.2.3.2 Development of training programs

6.2.3.3 Description of training programs (Note length, expense, organization, materials, techniques used.)

6.2.3.4 Evaluation of effectiveness of training

6.2.4 Extra Staff Requirements

6.2.4.1 Supervisory requirements

6.2.4.2 Paraprofessional requirements

6.2.4.3 Consultants

6.2.5 Extent of Product Modification Possible

6.2.6 Degree of Administrative Support Needed

6.2.7 Importance of Public Relations Effort Prior to Adoption

6.3 Success of Installation Procedures

6.3.1 Favorable and Unfavorable Conditions

6.3.2 Effective and Not So Effective Procedures

6.3.3 Methods for Obtaining Feedback From Users

7.0 FUTURE OF THE PRODUCT

7.1 Expected Use or Impact of Product

7.2 Anticipated Revisions of Product

Appendix E

PROJECT IMPACT

Project Director Interview Form*

Project ID#/Title: _____

Location/Region: _____

Funding Category/
Project Type: _____

Timelines: _____

Funds by FY: _____

Number of Partici-
pants by Group: _____

General Information

1. Describe in one sentence the general purpose of this project.

2. Where did the idea for this project originate?

   _____ RFP from state department _____ LEA _____ Other

   Comment:

3. Could you list the three major results or products of the project?

4. What three factors do you feel were especially important in facilitating the implementation of this project? (Example: strong support from the district superintendent, teamwork among project staff, etc.)

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* Adapted from McCaslin et al. (1976) of the Kentucky Bureau of Vocational Education.

5. What major barriers or roadblocks were encountered while implementing this project? (Example: insufficient time to fulfill project objectives, unclear project goals, etc.)

A. PROJECT RESOURCES

6. Were the support services (secretarial, printing, graphics) sufficient for implementing the project?

_____ Yes _____ No

Comment:

7. Were the number of paid project staff who worked on the project sufficient for implementing the project objectives?

_____ Yes _____ No

Comment:

8. Was the amount of time allocated for implementing the project sufficient?

_____ Yes _____ No

Comment:

---

* Note to interviewer: Throughout the questionnaire when you receive negative answers, ask if they think it affected the outcome of the project.

9. Was the amount of time for responding to the RFP sufficient?

_____ Yes _____ No

Comment:

10. Were there sufficient funds to implement the objectives of the project?

_____ Yes _____ No

Comment:

11. Were funds provided in a timely manner?

_____ Yes _____ No

Comment:

12. Was sufficient flexibility allowed by the funding agency in use of the funds?

_____ Yes _____ No

Comment:

13. Were equipment, supplies and space sufficient for implementing the project?

_____ Yes _____ No

Comment:

B. PROJECT STAFF

14. What was your job position, title, and area of specialization before you became the project director?

15. How many professional* staff members worked on this project?

Comment:

16. How many of the project staff were:

_____ Full-time _____ Part-time (what %)

Comment:

---

* Excluding clerical help.

17. How many of the professional staff members had either previous experience on a similar R & D project or preservice training directly relating to the project objectives?

Comments:

18. In your opinion, was this project characterized by a high level of communication:

a. among project staff members? _____ Yes _____ No _____ NA

b. with the project monitor? _____ Yes _____ No _____ NA

Comment:

19. Was any project related inservice training provided for the project staff during the course of the project?

_____ Yes _____ No

Comment:

20. Was there any turnover in professional staff during the project?

_____ Yes _____ No

I yes, how many staff members changed during the course of the project?

21. Did the project enjoy a high level of visibility and acceptance within your school district?

_____ Yes _____ No _____ NA

Comment:

C. ORGANIZATIONAL CLIMATE

22. Did you receive backup and moral support for the project from:

a. The chief administrative officer for the district? (or agency director?)

_____ Yes _____ No _____ NA

Comment:

b. The building principal? (or your immediate supervisor?)

_____ Yes _____ No _____ NA

Comment:

23. Have the administrators and staff of this school district (or agency) demonstrated commitment to research and exemplary efforts?

_____ Yes _____ No _____ NA

Comment:

24. Has your district or agency participated in R and D projects prior to this one?

_____ Yes _____ No _____ NA

Comment:

25. To whom did the project director report?

_____ Project Director reports directly to Research Development Unit

_____ Project Director reports to school or agency administration

_____ Other

Comment:

D. PROJECT PLANNING

26. Were specific objectives for the project written out? (If yes, ask to see them)

_____ Yes _____ No

27. Are the objectives stated in terms of behavioral changes or specific outcomes which will be produced?

_____ Yes _____ No

Comment:

28. Did the project staff, sponsors and participants view the project goals similarly?

_____ Yes _____ No

28. (Cont'd.)

If no, please explain any disagreements and assess their impact on the project.

29. Were position descriptions prepared to define the roles and functions?

a. of project staff members? _____ Yes _____ No

b. of project monitor? _____ Yes _____ No

If yes, ask to see them. (Comment on their clarity and specificity below.)

If no, what effect did this have on the project?

30. Were the tasks which the project hoped to complete clearly spelled out through a PERT chart, Gantt chart or task breakdown?

_____ Yes _____ No

If yes, ask to see it. (Comment on its completeness and clarity below.)

If no, what effect did this have on the project?

Comment:

31. Do you feel that the scope of work for the project was realisitic?

_____ Yes _____ No

Comment:

32. Was an advisory committee or other community groups used in planning or implementing the project?

_____ Yes _____ No _____ NA

If yes, could you describe the composition of the group and how it assisted the project?

33. Was an evaluation component built into your original project plan? (ask to see)

_____ Yes _____ No _____NA

Comment:

E. PROJECT CHARACTERISTICS

34. Did the project require changes in any established pattern in the school or classroom?

_____ Yes _____ No _____NA

Comment:

35. Did the project require a time commitment from participants other than regular school hours?

_____ Yes _____ No _____ NA

Comment:

36. Did the project facilitate individual initiative and flexibility on the part of participants? (Did participants incorporate their own ideas into the project?)

_____ Yes _____ No _____ NA

Comment:

F. PROJECT IMPLEMENTATION

37. Did implementing the project require interacting with ongoing school programs? (as opposed to being self-contained)

_____ Yes _____ No _____ NA

If yes, what type of interaction?

Comment:

38. Did the goals of the project change during project implementation?

_____ Yes _____ No _____ NA

If yes, in what way?

39. Did you utilize any consultative assistance during this project?

_____ Yes _____ No

40. What type?

41. Who provided it?

42. Was it helpful? _____ Yes _____ No

Comment:

43. Did you have the freedom to make decisions and necessary changes in the project as it progressed?

_____ Yes _____ No

44. Do you think that the participants of this project (teachers, counselors, students, etc.) had a clear conception of what the project was all about?

_____ Yes _____ No _____ NA

If no, then why not?

Comment:

45. Do you believe that the project participants were provided with all the help (orientation and inservice) necessary to successfully participate in the project?

_____ Yes _____ No _____ NA

Comment:

46. Were you able to build and maintain the motivation of project participants?

_____ Yes _____ No _____ NA

Comment:

G. PROJECT EVALUATION

47. Did the project have ongoing evaluation?

_____ Yes _____ No _____ NA

If yes, briefly describe:

48. Was the evaluation helpful?

_____ Yes _____ No _____ NA

If yes, briefly describe the changes made as a result of the evaluation.

49. Was a final evaluation conducted to evaluate the effectiveness of the project?

_____ Yes _____ No _____ NA

If yes, briefly describe.

50. Would you describe the data collected in the final evaluation as being hard, objective data (empirical) or soft, subjective data (judgmental)?

_____ Hard, objective _____ Soft, subjective _____ NA

51. Do you believe that the end products (materials, procedures, ideas, etc.) justified the resources expended?

_____ Yes _____ No

If no, then why?

52. Do you expect the products of the project to withstand the test of time in your district? (Will they still be used in two years?)

_____ Yes _____ No _____ NA

53. Did the project meet all its objectives?

_____ Yes _____ No _____ NA

Comment:

54. Have positive changes occurred in the knowledge, attitudes, or behaviors of participants as a result of the project?

_____ Yes _____ No _____ NA

If yes, what changes?

55. Were any activities or incentives built into the project to encourage use of the product or outcome beyond the current project?

_____ Yes _____ No _____ NA

Comment:

H. RELATIONSHIP WITH THE RDU

56. Do you feel that most of the vocational educators in Illinois are aware of the RDU and its activities? How could awareness be improved?

_____ Yes _____ No

Comment:

57. What services and assistance provided by the RDU have been helpful to you? Your school?

58. How could the RDU improve its process for soliciting, reviewing, selecting and monitoring R & D projects?

59. What additional services might the RDU perform to facilitate research and development in Illinois?

Appendix F

PROJECT IMPACT

Participant Questionnaire

We hope that you might take time from your busy schedule to assist us in this effort.

All items on this questionnaire refer to the following project:

1. Which category of individuals do you belong to in relation to this project? (Please check one.)

   _____ Student _____ Guidance Counselor

   _____ Teacher _____ Other _____
   (please specify)

2. Are you currently involved with this project?

   _____ Yes _____ No

3. Are you currently using products (materials, processes or findings) developed in this project?

   _____ Yes _____ No products were developed

4. In your opinion, was this project successful?

   _____ Yes _____ No

   Why or why not?

5. Was the purpose of the project clear to you?

   _____ Yes _____ No

6. Do you believe that you were provided with all the necessary help in fully understanding your part in the project?

   _____ Yes _____ No

---

* Adapted from McCaslin et al. (1976) of the Kentucky Bureau of Vocational Education

7. Were you provided with all the physical resources (space, materials, equipment) to successfully participate in the project?

_____ Yes _____ No

8. Do you feel that the motivation of the project participants was built and maintained throughout the project?

_____ Yes _____ No

9. List three (3) things that you thought were strengths of the project.

1.

2.

3.

10. List three things that you thought were weaknesses of the project.

1.

2.

3.

11. Did the project require changes in any established patterns of the school or classroom?

_____ Yes _____ No

12. Did your project require an excessive amount of your time?

_____ Yes _____ No

13. Do you feel that the project personally benefited you?

_____ Yes _____ No

If yes, in what way?